

38% Efficient Low-Cost Six-Junction GaAs/InP Solar Cells Using Double Epitaxial Lift-Off, Phase I

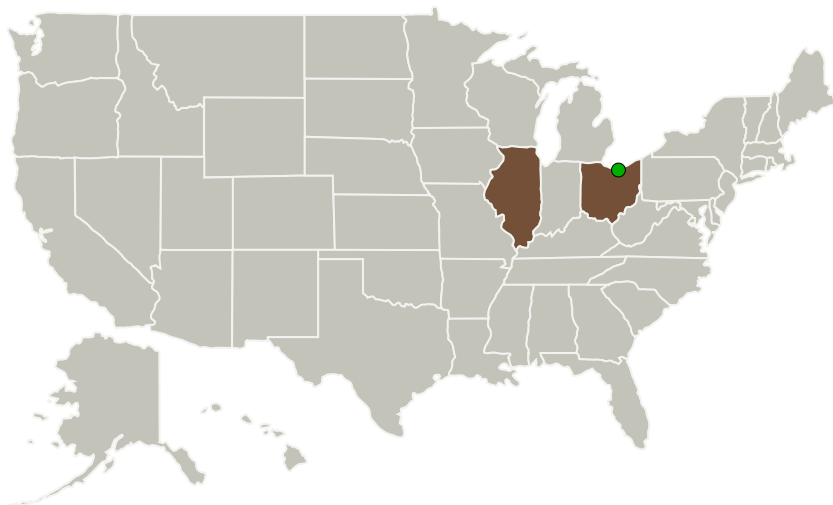
Completed Technology Project (2016 - 2016)



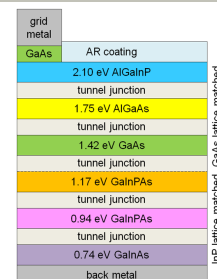
Project Introduction

Double epitaxial lift-off (D-ELO) in conjunction with semiconductor bonding will be leveraged to produce 38% efficient six-junction solar cells. These solar cells will enable optimal performance for future NASA missions that require solar cells with high specific power, high power conversion efficiency, and lower cost than the incumbent solar cell technology. High efficiency is enabled by the use of six AM0 spectrum-matched subcell junctions. A reduction in mass compared to incumbent technology is enabled by removal of the thick semiconductor substrates while a cost savings compared to incumbent technology is enabled by the recovery and subsequent reuse of the expensive semiconductor substrates via the D-ELO process.

Primary U.S. Work Locations and Key Partners



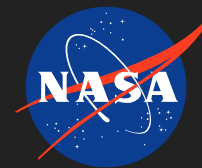
Organizations Performing Work	Role	Type	Location
MicroLink Devices, Inc.	Lead Organization	Industry Minority-Owned Business	Niles, Illinois
● Glenn Research Center(GRC)	Supporting Organization	NASA Center	Cleveland, Ohio



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Primary U.S. Work Locations

Illinois

Ohio

Project Transitions



June 2016: Project Start

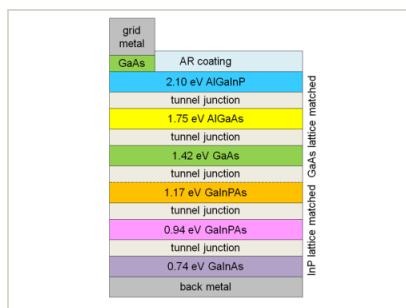


December 2016: Closed out

Closeout Documentation:

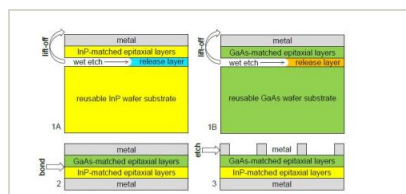
- Final Summary Chart(<https://techport.nasa.gov/file/140371>)

Images



Briefing Chart Image

38% Efficient Low-Cost Six-Junction GaAs/InP Solar Cells Using Double Epitaxial Lift-Off, Phase I
(<https://techport.nasa.gov/image/134799>)



Final Summary Chart Image

38% Efficient Low-Cost Six-Junction GaAs/InP Solar Cells Using Double Epitaxial Lift-Off, Phase I Project Image
(<https://techport.nasa.gov/image/135525>)

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Organization:

MicroLink Devices, Inc.

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Principal Investigator:

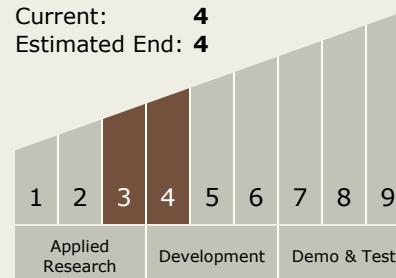
Alex Kirk

Technology Maturity (TRL)

Start: **3**

Current: **4**

Estimated End: **4**



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Technology Areas

Primary:

- TX03 Aerospace Power and Energy Storage
 - └ TX03.1 Power Generation and Energy Conversion
 - └ TX03.1.1 Photovoltaic

Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System